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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,263	09/22/2003	Peter Kogge	UNND-0022-4	5461

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EXAMINER	
MCLEAN MAYO, KIMBERLY N	
ART UNIT	**PAPER NUMBER**
2187	

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,263	KOGGE, PETER	
	Examiner	Art Unit	
	Kimberly N. McLean-Mayo	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The enclosed detailed action is in response to the Application submitted on September 22, 2003.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 12 and 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Examiner was not able to find any support/description of the features cited in claims 12 and 30.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-11, 16, 19-29 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Olnowich (USPN: 6,343,346).

Regarding claims 1, 10, 19 and 28, Olnowich discloses a computer system comprising at least one first node having at least one first memory (Figure 1, References 30 and 54; C 7, L 32-34); and a first threadlet (program/process) for causing (via memory controller interface) a first program to run in the computer system when the at least one first memory is local to the first threadlet (C 20, L 46-62);

Regarding claims 2 and 20, Olnowich discloses the first program requiring access to a first memory location to run (C 20, L 46-53)'

Regarding claims 3 and 21, Olnowich discloses the first threadlet is capable of determining (via the memory controller) whether or not the first memory location is local to the first threadlet (C 7, L 46-48; C 8, L 61-66).

Regarding claims 4-5 and 22-23, Olnowich discloses the computer system is capable of saving the first threadlet and a state of the first threadlet in a parcel (C 7, L 49-51; the processor performs a thread switch which inherently saves the thread and its state [address of instruction to resume; program counter content] so that the processor may switch back to the thread).

Regarding claims 6 and 24, Olnowich discloses the computer system is capable of injecting the parcel into a communication network (C 7, L 51-53; C 22, L 2-5, L 26-30; Olnowich teaches that the memory controller may send information/messages to other nodes via the network adapter and thus the computer system is capable of injecting the parcel into a communication network).

Regarding claims 7 and 25, Olnowich discloses the computer system is capable of determining that the parcel has reached a second node after being injected into the communication network (C 26, L 16-49; the receiving node coupled to the communication network is capable of sending response messages to the sending node and thus the computer system is capable of determining that a parcel reached a second node via response messages).

Regarding claims 8 and 26, Olnowich discloses the computer system is capable of unpacking the first threadlet state from the parcel and restarting the first threadlet (all of the nodes in the computer system comprises identical components [C 10, L 26-28]; therefore, since each node is capable of restarting a thread by unpacking [examining and processing] the parcel [saved thread and its state] (C 7, L 58-61); and the system is capable of transferring information to a second node via the communication network, the computer system is capable of unpacking the first threadlet state from the parcel and restarting the first threadlet).

Regarding claims 9 and 27, Olnowich discloses the computer system is capable of verifying that the first memory location is within the second node (C 20, L 46-53; C 21, L 13-14; C 8, L 61-67; C 9, L 1-14; the computer system is capable of verifying that the first memory location is within the second node by receipt of the data [from the second node] stored at the first memory location within the second node).

Regarding claims 11, 16, 29 and 34, Olnowich discloses the computer system including a plurality of first nodes and each first memory of each of the first nodes includes a copy of the first program (Figure 1; Olnowich discloses a SMP system (C 10, L 34-36) and in SMP systems, the processors/execute individual processes from the same program in parallel).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 13-14 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olnowich (USPN: 6,343,346).

Olnowich discloses saving the state of the threads, however, Olnowich does not disclose the width of the thread state. It is evident that the width of the thread state is sufficient to allow the system to store the required information needed to resume execution of the thread. It is an obvious matter of design choice as to the width of the thread state. The Applicant has not disclosed that the widths of the thread state provides an advantage or solves a particular problem. One of ordinary skill in the art would have expected Olnowich's system to perform equally well with either the width used by Olnowich or the width taught by Applicant because both perform the same function of providing the information necessary to process the thread.

8. Claims 15, 17-18, 33 and 35-36 rejected under 35 U.S.C. 103(a) as being unpatentable over Olnowich (USPN: 6,343,346) in view of Sterling et al., Gilgamesh: A Multithreaded Processor-in-Memory Architecture for Petaflops Computing.

Olnowich discloses the limitations cited above in claims 1, 16, 19 and 34, however, Olnowich does not disclose the first nodes on a PIM-enhanced memory chip or set of PIM enhanced chips interconnected by a communication network. Sterling discloses a parallel computing system wherein the nodes are PIM devices interconnected by a communication network (Abstract, Figures 1 and 2). Sterling teaches that this feature provides parallel systems with higher scalability, adaptability, robustness, fault tolerance and lower power consumption than current multiprocessor system (Abstract). Olnowich discloses a parallel computing system (Abstract). One of ordinary skill in the art would have recognized the benefits afforded to parallel computing system by Sterling's teachings and would have been motivated to use such teachings in the system taught by Olnowich for the desirable purpose of higher scalability, adaptability, robustness, fault tolerance and lower power consumption.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Holmes et. al., Processing in Memory : The Terasys Massively Parallel PIM Array, IEEEE 1995 – PIM network

Kogge et. al., Implications of a PIM Architectural Model for MPI, Cluster2003 Convention, 12/2003 – traveling threads and PIM architecture.

De Backer et al (USPN: 6,266,745) – thread migration

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly N. McLean-Mayo whose telephone number is 571-272-4194. The examiner can normally be reached on Mon, Wed, Thurs (10-4), Tues (9:45 - 6:15).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 571-272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KIMBERLY MCLEAN-MAYO
PRIMARY EXAMINER

Kimberly N. McLean-Mayo
Primary Examiner
Art Unit 2187

KNM

March 15, 2006